ABSTRACT

STUDY OF INCLUSION COMPLEX FORMATION BETWEEN para METHOXYCINNAMIC ACID AND β-CYCLODEXTRIN

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para Methoxycinnamic Acid (pMCA) is a semi-synthetized substance from Kaempferia galanga rhizome with analgesic and anti inflammatory activity. pMCA has a poor solubility in water, therefore it was formed as an inclusion complex with β-cyclodextrin. The ability of β-cyclodextrin to form an inclusion complex with a guest molecule is a function of two factors. The first is steric and depends on the relative size of β-cyclodextrin cavity to the size of the guest molecule. The second is the thermodynamic interaction between the different components of the system. Formation of an inclusion complex in the water containing various concentrations of β-cyclodextrin (0,0; $2{,}5.10^{-3}$; $5{,}0.10^{-3}$; $7{,}5.10^{-3}$; and $10{,}0.10^{-3}$ M) and various temperatures (32, 37, and 42 ± 0,5℃) could be determined by the solubility method. pMCA solubility is determined at saturated solubility time using waterbath shaker at shaking speed 150 rpm. Dissolved pMCA were measured using a UV-Vis spectroscopy at pMCA's maximum wavelength of 286,0 nm. The result showed that solubility of pMCA increased by the increasing of β-cyclodextrin concentration. The increasing of temperature made the complex stability constant decreased. The result showed that inclusion complex formation between pMCA and β-cyclodextrin had negative ΔH, negative ΔG, and positive ΔS.

Keywords : inclusion complex, para methoxycinnamic acid (pMCA), β-cyclodextrin, solubility enhancement, complex stability constant